ACT Aspire

5th Grade Mathematics — Performance Level Descriptors

Reporting Categories	Needs Support	Close	Ready	Exceeding
Operations and Algebraic Thinking Focus is on numerical expressions. Students compare patterns, developing early function reasoning.	*A student performing at the Needs Support level:* • writes simple numerical expressions composed of two operations that record calculations with numbers. • expresses the relationship between two terms in a number sentence or pattern.	*A student performing at the Close level:* • translates verbal descriptions of up to three numerical operations to symbolic expressions, including expressions involving parentheses. • compares two numerical patterns, describing the relationship between the corresponding terms. • expresses the relationship between terms in a given verbal number sentence or numerical pattern.	*A student performing at the Ready level:* • interprets numerical expressions without evaluating them. • writes expressions involving parentheses, including from a real-world problem. • plots ordered pairs in the first quadrant of a coordinate plane derived from the relationship between corresponding terms of two numerical patterns. • makes sense of a real-world problem involving any of the four operations and writes an expression that reflects that given situation.	*A student performing at the Exceeding level:* • writes and evaluates expressions involving multiple sets of parentheses, including from a real-world problem. • describes the relationships between ordered pairs by using coordinates from a graph. • makes sense of a real-world problem involving any of the four operations and writes an expression that reflects that given situation and then uses the expression to solve the problem.
Number and Operations in Base Ten Focus is on understanding the coherence of place-value for whole numbers and decimals, and how operations with whole numbers translate to decimals.	*A student performing at the Needs Support level:* • recognizes that in a multi-digit whole number the place value of any digit represents 10 times as much as the place value of the digit to the right. • reads and writes decimal numbers to hundredths. • interprets a given model representing a decimal to the hundredths place.	*A student performing at the Close level:* • recognizes and explains the patterns in the number of zeros in the product when multiplying by powers of 10. • compares decimal numbers to hundredths. • adds, subtracts, multiplies, or divides decimal numbers to the hundredths using models, place value, or properties of operations. • constructs a model, such as a number line, to round decimals to the hundredths place.	*A student performing at the Ready level:* • recognizes that in a multi-digit number the place value of any digit represents 1/10 times as much as the place value of the digit to the left. • recognizes and explains patterns in placement of the decimal point when multiplying or dividing by powers of 10. • uses and explains a standard algorithm to multiply multi-digit whole numbers. • rounds decimal numbers to the hundredths place. • uses place-value understanding to rewrite decimal numbers in expanded form. • calculates accurately when using the standard algorithms to multiply multi-digit whole numbers and decimals to hundredths, and rounds as appropriate.	*A student performing at the Exceeding level:* • compares numbers written in expanded or standard form. • solves multi-step problems involving all four operations with decimals to hundredths and division of whole numbers with up to four-digit dividends and two-digit divisors. • rounds decimal numbers to any place value. • solves multi-step problems involving decimals to hundredths accurately and efficiently.
Number and Operations—Fractions Focus is on deepening understanding of fraction multiplication and division, and on developing fluency with fraction addition and subtraction through equivalent fractions.	*A student performing at the Needs Support level:* • uses a model to multiply a fraction by a fraction. • uses a model, such as fraction bars or an area model, to represent problems involving addition and subtraction of fractions with common denominators or multiplication of fractions by a whole number.	*A student performing at the Close level:* • solves mathematical or real-world word problems involving addition and subtraction of fractions and mixed numbers with unlike denominators of 2, 3, 4, 5, or 10. • divides a fraction by a whole number or a whole number by a fraction. • understands or evaluates a model to show equivalent fractions.	*A student performing at the Ready level:* • multiplies a fraction between zero and one by a whole number and explains why the result is smaller than the original whole number. • solves mathematical or real- word problems involving addition and subtraction of fractions and mixed numbers with unlike denominators. • makes sense of a real-world problem using addition and subtraction of fractions and mixed numbers with unlike denominators to find a solution.	*A student performing at the Exceeding level:* • solves real-world problems involving multiplication of fractions and mixed numbers. • solves multi-step mathematical and real-world problems involving addition and subtraction of fractions with unlike denominators. • makes sense of multi-step problems involving several related parts of a whole.
Measurement and Data Focus is on the concept of volume and relations to multiplication and addition. Students convert measurements to different units and continue to represent and interpret data.	*A student performing at the Needs Support level:* • converts among the units within the metric system in order to solve basic mathematical problems. • solves single step mathematical and real-world problems involving volume of right rectangular prisms. • uses operations on fractions with like denominators of 2 and 4 to solve problems involving information presented in line plots. • uses unit cubes to model the volume of a right rectangular prism.	*A student performing at the Close level:* • converts among the units within the metric system in order to solve single-step real-world or mathematical problems. • counts unit cubes to find the volumes of composite right rectangular prisms. • solves two-step mathematical and real-world problems involving volume of right rectangular prisms. • uses addition and subtraction on fractions with like denominators of 2, 4, and/or 8 to solve problems involving information presented in line plots. • finds the volume of a right rectangular prism by multiplying side lengths. • uses a model of an irregular rectangular prism and reasons abstractly to understand the complete structure of the shape in order to find volume.	*A student performing at the Ready level:* • converts among the units within a non-metric measurement system in order to solve single-step real-world or mathematical problems. • determines and uses an appropriate system of units for a given measurement. • solves multi-step mathematical and real-world problems involving volume of right rectangular prisms. • uses all four operations on fractions with unlike denominators of 2, 4, and 8 referring to the same whole to solve problems involving information presented in line plots. • makes sense of an irregular rectangular prism to find the sides lengths and then uses a volume formula to find the volume of the shape.	*A student performing at the Exceeding level:* • converts among the units within a non-metric measurement system in order to solve multi-step real-world or mathematical problems. • solves multi-step mathematical and real-world problems involving the volume of a composite figure composed of two or more non-overlapping right rectangular prisms. • constructs line plots to display a data set of measurements in fractions with denominators of 2, 4, and 8. • makes sense of quantities and units, using the units as a way to attend to the meaning of the quantities.
Geometry Focus is on categories of 2-dimensional figures based on properties. The coordinate plane is introduced.	*A student performing at the Needs Support level:* • identifies triangles, squares, rectangles, and trapezoids. • reasons about the properties of triangles and quadrilaterals in order to recognize them.	*A student performing at the Close level:* • graphs the coordinates of the order pair for a given point in the first quadrant of the coordinate plane. • classifies triangles as isosceles, equilateral, scalene, right, acute, and/or obtuse. • classifies parallelograms, squares, rhombuses, and rectangles based on their properties. • creates a graph model by plotting ordered pairs in the first quadrant of a coordinate plane. • reasons about the properties of triangles and quadrilaterals in order to classify them.	*A student performing at the Ready level:* • identifies the coordinates of the ordered pair for a given point in the first quadrant of the coordinate plane. • classifies and compares triangles, squares, rectangles, rhombuses, parallelograms, kites, and trapezoids based on their properties. • interprets a graph model by identifying coordinate pairs in the first quadrant of a coordinate plane. • constructs a viable argument to classify and compare triangles and quadrilaterals based on their properties.	*A student performing at the Exceeding level:* • represents real-world problems by graphing points in the first quadrant of the coordinate plane and interprets the coordinate values in the context of the situation. • uses properties to explain and justify the classifications of polygons. • creates a graph to model a real-world problem on a coordinate plane and then interprets a value. • constructs a viable argument to justify the classification of polygons by using clear definitions and examples.
Modeling Producing, interpreting, understanding, evaluating, and improving mathematical models.	*A student performing at the Needs Support level:* • uses manipulatives to represent a problem or concept.	*A student performing at the Close level:* • uses manipulatives to interpret a problem or concept.	*A student performing at the Ready level:* • evaluates a manipulative model to solve a problem or explain a concept.	*A student performing at the Exceeding level:* • uses manipulatives to improve a model of a problem or concept.

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5th Grade Mathematics — Performance Level Descriptors

(Continued)

Reporting Categories	Needs Support	Close	Ready	Exceeding
Justification and Explanation Giving reasons, explaining "Why?"	*A student performing at the Needs Support level:* • explains a pattern using words, expressions, and operations, or generates a sequence from a rule. • identifies an error in reasoning. • uses two or more specific statements to draw a conclusion.	*A student performing at the Close level:* • uses conditional statements. • draws and labels relevant visual representations. • explains steps of a procedure. • provides a counterexample. • uses a pattern or sequence to draw a conclusion. • identifies an error in reasoning and gives a justification of why it is an error.	*A student performing at the Ready level:* • draws conclusions using both a specific and general evidentiary statement. • provides general support for a claim in order to reach a conclusion. • uses and cites conditional statements, specific aspects of created visual representations, and/or computations or procedures to clarify an argument or draw a conclusion. • justifies and defends conclusions by explaining errors in reasoning or calculations, providing counterexamples, applying relevant classification schemes, and/or verifying statements or claims used to draw a conclusion.	*A student performing at the Exceeding level:* • provides a coherent, logical argument or solution pathway by providing evidence to support claims. • provides thorough justification and defends conclusions by using multiple, connected statements and incorporating justification techniques such as explaining errors in reasoning or calculations, providing counterexamples, applying relevant classification schemes, and/or verifying statements or claims used to draw a conclusion.
Foundation Integrate and continue to grow with topics from prior grades.	*A student performing at the Needs Support level:* • fluently adds, subtracts, and multiplies single-digit whole numbers. • understands whole number place value. • understands fractions as parts of a whole. • solves mathematical or real-world problems involving addition and subtraction of fractions with like denominators. • multiplies a whole number by a fraction using a model. • recognizes patterns and finds the next term in a pattern. • recognizes when angles are right, acute, or obtuse. • understands the properties of geometric figures by using sides and angles.	*A student performing at the Close level:* • explains standard algorithms to add and subtract multi-digit whole numbers. • uses place-value understanding to rewrite whole numbers in expanded form. • rewrites fractions in equivalent fractional forms and uses visual models to verify the equivalence. • understands units of measure.	*A student performing at the Ready level:* • fluently divides single-digit whole numbers.	*A student performing at the Exceeding level:* • checks when comparing fractional parts that they are fractions of the same whole.
Mathematical Practices Collected PLDs that focus on mathematical practices.	*A student performing at the Needs Support level:* • expresses the relationship between two terms in a number sentence or pattern. • interprets a given model representing a decimal to the hundredths place. • uses a model, such as fraction bars or an area model, to represent problems involving addition and subtraction of fractions with common denominators or multiplying fractions by a whole number. • uses unit cubes to model the area of a right rectangular prism. • reasons about the properties of triangles and quadrilaterals in order to recognize them. • uses manipulatives to represent a problem or concept. • explains a pattern using words, expressions, and operations or generates a sequence from a rule. • identifies an error in reasoning. • uses two or more specific statements to draw a conclusion.	*A student performing at the Close level:* • expresses the relationship between terms in a given verbal number sentence or numerical pattern. • constructs a model, such as a number line, to round decimals to the hundredths place. • understands or evaluates a model to show equivalent fractions. • uses a model of an irregular rectangular prism and reasons abstractly to understand the complete structure of the shape in order to find volume. • creates a graph model by plotting ordered pairs in the first quadrant of a coordinate plane. • reasons about the properties of triangles and quadrilaterals in order to classify them. • uses manipulatives to interpret a problem or concept. • uses conditional statements. • draws and labels relevant visual representations. • explains steps of a procedure. • provides a counterexample. • uses a pattern or sequence to draw a conclusion. • identifies an error in reasoning and gives a justification of why it is an error.	*A student performing at the Ready level:* • makes sense of a real-world problem involving any of the four operations and writes an expression that reflects that given situation. • calculates accurately when using a standard algorithm to multiply multi-digit whole numbers and decimals to hundredths, and rounds as appropriate. • makes sense of a real-world problem using addition and subtraction of fractions and mixed numbers with unlike denominators to find a solution. • makes sense of an irregular rectangular prism to find the sides lengths and then uses a volume formula to find the volume of the shape. • interprets a graph model by identifying coordinate pairs in the first quadrant of a coordinate plane. • constructs a viable argument to classify and compare triangles and quadrilaterals based on their properties. • evaluates a manipulative model to solve a problem or explain a concept. • draws conclusions using both a specific and general evidentiary statement. • provides general support for a claim in order to reach a conclusion. • uses and cites conditional statements, specific aspects of created visual representations, and/or computations or procedures to clarify an argument or draw a conclusion. • justifies and defends conclusions by explaining errors in reasoning or calculations, providing counterexamples, applying relevant classification schemes, and/or verifying statements or claims used to draw a conclusion.	*A student performing at the Exceeding level:* • makes sense of a real-world problem involving any of the four operations and writes an expression that reflects that given situation and then uses the expression to solve the problem. • solves multi-step problems involving decimals to hundredths accurately and efficiently. • makes sense of multi-step problems involving several related parts of a whole. • checks when comparing fractional parts that they are fractions of the same whole. • makes sense of quantities and units, using the units as a way to attend to the meaning of the quantities. • creates a graph to model a real-world problem on a coordinate plane and then interprets a value. • constructs a viable argument to justify the classification of polygons by using clear definitions and examples. • uses manipulatives to improve a model of a problem or concept. • provides a coherent, logical argument or solution pathway by providing evidence to support claims. • provides thorough justification and defends conclusions by using multiple, connected statements and incorporating justification techniques such as explaining errors in reasoning or calculations, providing counterexamples, applying relevant classification schemes, and/or verifying statements or claims used to draw a conclusion.

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